

his various problems without always recurring to the mathematical point of view. Unfortunately, one word must be said regarding the typography. The present reviewer has seldom read a book so badly corrected for the press. There are two pages of corrigenda; but a full statement of all the small misprints would with difficulty be contained in four or five pages more. If it is not *c* for *o* or *e*, it is *u* for *n*, or *l* for *t*, or *b* for *h*, or *das* for *dass*. This is the more to be regretted because—granted the author's point of view—the *i*'s of the philosophy are quite carefully dotted.

BRITISH MINERALS.

A Handbook to a Collection of the Minerals of the British Islands in the Museum of Practical Geology.

By F. W. Rudler, I.S.O. Pp. x+241. (London: H.M. Stationery Office, 1905.) Price 1s.

SINCE his retirement from the post he so long and efficiently held as curator of the Museum of Practical Geology, Mr Rudler has installed in that museum a collection illustrative of the modes of occurrence of British minerals. The museum has long possessed collections of British rocks, fossils, and ores, the last named arranged under the various metals which they contain. In the new collection, which is neatly arranged in twelve table-cases, the minerals found in each district are brought together; half the space is allotted to Cornwall and Devon, one-eighth to Scotland, Ireland, and the Isle of Man, and the remainder to the rest of England, the divisions being roughly according to the several mining districts, with a general group for the minerals of the Neozoic strata. The specimens, to the number of 1652, have mostly been selected from the Ludlam collection, which was bequeathed to the museum in 1880; though mostly small in size, they are of excellent quality. In addition to the name and locality attached to each specimen, there are many explanatory labels in the cases, and the present volume admirably serves the purpose of a guide to the collection.

The volume is by no means a tedious catalogue or descriptive list of all the individual specimens, but is rather an extremely readable and interesting account of the mode of occurrence and history of the more common British minerals, especially those which are of economic importance. Instead of long descriptions of the characters of species, much is said of their paragenetic relations, and many valuable suggestions are made as to their possible modes of origin. The book will therefore be found interesting and instructive not only to mineralogists, but also to geologists and miners; whilst quite apart from the collection, for which it is primarily intended, it will have a permanent value as a treatise. In this connection mention may be made of the numerous and extremely valuable references to original authorities consulted in the preparation of the work.

The mode of treatment is a novel one, and necessarily involves a certain amount of repetition, especially in the case of some of the more commonly

occurring minerals, such as quartz, calcite, galena, &c., which may be found in almost all the different districts; but this repetition is not tedious. As an example, the district of Cornwall and Devon may be taken, in which the main groups are as follows:—cassiterite, minerals associated with cassiterite, copper sulphides and sulpho-ferrites, copper-bearing minerals of the gozzans, arsenates and phosphates of the copper-gozzans, ores of lead, zinc, antimony, &c., sulphides and sulpho-salts, ores of iron, &c., minerals of the rarer metals, the spars of the mineral veins, miscellaneous minerals.

Apart from a few minor misprints, the only point which calls for criticism is that undue importance seems to have been attached to many quite trivial and local names. As for the printing, there is certainly much room for improvement; the lines are so badly broken that it is surprising that the whole did not fall to pieces in the course of printing.

L. J. S.

OUR BOOK SHELF.

Moths and Butterflies. By Mary C. Dickerson. Pp. xviii+344; with 200 photographs from life by the author. (Boston, U.S.A., and London: Ginn and Co., n.d.) Price 5s. net.

THIS is a prettily got-up book, intended for the training of classes in "nature-study," with reference to a considerable number of common and conspicuous North American butterflies and moths, the life-history of which is very fully described and illustrated. The concluding chapter, on collecting, keeping, and studying, recapitulates the points to be noted in practical observations on the insects themselves.

To English readers the book will be useful for the information it supplies about American forms, and also as indicating a similar method of study for British insects, but many of the species here noticed are much larger and more conspicuous than those likely to fall under our own observation, among them being several species of *Papilio*, and large *Saturniidae*.

The figures, of which (including apparatus, &c.) there are 233 in all, are generally very good, though some are indistinct. The frontispiece, representing a *Smerinthus* at rest, and Fig. 17, on p. 147, representing a procession of the young caterpillars of *Saturnia*, may be specially noticed. But it looks odd to see a *Smerinthus* closely allied to our own *S. ocellatus* called "a most beautiful little moth" (p. 232); and, though we do not object to the use of appropriate English names, we are sorry to see on p. 231 a *Sphinx* allied to *S. convolvuli* called "the Humming-Bird Hawkmoth," a name by which the very different *Macroglossa stellatarum* has been known all the world over, ever since the commencement of the study of entomology.

We had expected to find some notice of the gipsy moth, the crusade against which has recently been given up in America in despair, but find only a passing reference. A few British species are noticed, such as *Vanessa antiopa*, called in America the mourning cloak, a translation of its German name; *V. atalanta*, *Pieris rapae*, &c.

A great deal of useful general information is given in the book, and it seems on the whole to be careful and accurate. One statement, however true in the abstract, ought not to have been made without qualification or explanation in a popular book. On p. 267 we read, "We are familiar with the fact that all living

creatures develop from eggs." Further comment is needless.

Although published in 1901 and mentioned in the *Zoological Record* for that year, this book has not previously been brought under our notice.

Second Stage Magnetism and Electricity. By Dr. R. Wallace Stewart. Second edition. Re-written and enlarged. Pp. viii+416. (London: W. B. Clive.) Price 3s. 6d.

THIS book is primarily intended to serve the purposes of a candidate preparing for the second stage examination under the Board of Education (secondary branch). In reading it, we have by no means made our first acquaintance with Dr. Stewart, and the perusal has left us of our old opinion that, whether regarded as text-books intended to prepare a student for a particular examination or as a source of culture, the books prepared by the author can be very earnestly recommended. He is a lucid and accurate writer. He knows where to draw the line so that an elementary student shall not be repelled by the complication of a subject.

The present volume is brought up to date. The importance of the field—that is, the medium surrounding an electrified conductor or magnet—is insisted on; perhaps even their importance is emphasised too much. The tendency of modern thought amongst physicists is to restore to a conductor part, at any rate, of the position that it held in pre-Maxwellian days. The dielectric plays a most important part—that is a position, won for it by Maxwell, which it can never lose. At the same time, one should not lose sight of the fact that there *must* be some mechanism at the ends of a line of induction, and to-day that mechanism is being studied under the name of *electron*. The electron is an essential part of a conductor, and the complete phenomena of electricity are not fully accounted for without including it.

The volume is almost entirely re-written. It is not surprising, therefore, that there are some unfortunate slips which have escaped the vigilance of the reader. As these are misleading, we will state that on the bottom of p. 33 "positive" and "negative" should be interchanged. The following phrase (p. 42) is very misleading:—"The portions of those walls, which are, as it were, in the shadow of these objects, possess no induced charge." We think that the first thirty pages might be improved in any later edition. Considerable care has evidently been taken; yet in many cases confusion is introduced by the neglect of some tiny detail. Thus, in describing the attraction and repulsion of a pithball with subsequent re-attraction, *if in the interval it comes in contact with an earth-connected body*, the phrase that we have put in italics is omitted; and in several cases where a body is touched to earth it is not explicitly said whether the contact is to be broken before a succeeding operation is performed or not. Why is it "evident" (p. 16) that doubling a charge will double the force it exerts on another charge?

Memoria sobre el Eclipse Total de Sol del día 30 de Agosto de 1905. By D. Antonio Tarazona. Pp. 125. (Madrid: Bailly-Baillière E. Hijos, 1904.)

THOSE who are familiar with the Spanish language and have made up their minds to go abroad and see the approaching total eclipse of the sun will find in this book a great amount of useful information relating to this interesting event. The work is issued from the Madrid Astronomical Observatory, the director, Francisco Iñiguez, having contributed a brief preface, and contains full particulars concerning the elements of this eclipse; in fact, it might be considered a treatise on the subject, so complete is the information. In

addition to a great many data which will be of special use to astronomers, there will be found a very full list of towns, in alphabetical order, at which totality occurs, with the times of the different phases of the eclipse. More generally useful perhaps will be found the maps at the end of the volume. These include a map of the world showing the position of the track from the commencement to the end of totality over the earth's surface. A second illustrates on a larger scale the Spanish portion of the track, with special lines showing the times of occurrence and duration of totality. The third, on a much larger scale (1:1,000,000), indicates that part of Spain alone over which the shadow sweeps, and is very complete as regards names of places, railways, &c. Lastly, two star charts are added, one showing the position of the eclipsed sun among the stars, and the second a key map to this chart giving the designations of the stars and planets in this region.

Visitors to Spain will do well to supplement their literature by securing this volume, and thanks are due to the Madrid Observatory for producing so useful a book so far in advance of the event.

Naturalistische und religiöse Weltansicht. By Rudolf Otto. Pp. 296. [Tübingen: J. C. B. Mohr (Paul Siebeck), 1904.] Price 3 marks.

NO better book than this could be recommended to the young philosophical or theological student who wishes to obtain a clear and comprehensive view of the debatable ground where science, philosophy, and theology meet. The author is well read, a skilful debater, a vigorous writer; and as handbooks ought not to be unnecessarily multiplied, it is to be hoped that this one will be translated.

Like many other works in defence of religion in general, the book is not so strong on the constructive as on the critical side. The author refers with approval to the attitude of Kant when he solved certain contradictions or antinomies by a reference to the world of things in themselves. As this is precisely the point where Kant's philosophy is most seriously questioned, the argument probably suffers to that extent. But, on the other hand, the author fully realises the unity of the various phases of the one problem religion *versus* naturalism, and the harm which has been done by concentrating the attention on one phase (e.g. the question of miracles) as if it were the whole.

The work is valuable mainly for its survey of the most interesting biological theories of the last century, from Darwin, Hæckel, Weismann, down to Wolff, Korschinsky, Driesch. The philosophical development of this last writer is sketched in an enlightening fashion. With regard to the general theory of development and "descent," the author comes to the conclusion that with the confirmation of any such theory only something relatively external is given, a clue to creation, which does not so much solve its problems as group them afresh. The index at the end of the work gives an explanation of the more difficult terms employed by modern theorists.

An Introduction to Projective Geometry and its Applications. By Dr. Arnold Emch. Pp. vii+267. (New York: Wiley and Sons; London: Chapman and Hall, Ltd., 1905.) Price 10s. 6d.

THIS text-book of modern projective geometry forms an admirable introduction to the subject, and should be known to all who are interested in this branch of mathematics. The first chapter deals with the general properties of projective ranges and pencils and their products; including harmonic and perspective projection, and the projective properties of the circle. Then